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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary

Application No.

10/075,602

Applicant(s)

HUNG ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 18, 21, 28, 29 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 18, 21, 28 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Abraham (US 6,004,884)

Abraham shows an example of a first chemistry $\text{Cl}_2/\text{Ar}/\text{CHF}_3$ etch of a wafer in a plasma reactor (column 10, lines 33-36), see TABLE 1 below.

TABLE 1

FIRST CHEMISTRY		TOP POWER	BOTTOM POWER		FLOW RATE	
	Range	350-650	100-350	30 sccm-110 sccm	12.5%-30%	19%-50%
				Cl_2	(of Cl_2 flow) CHF_3	(of Cl_2 flow) Ar
$\text{Cl}_2/\text{Ar}/\text{CHF}_3$	Preferred Range	400-600	120-200	35 sccm-80 sccm	15%-25%	25%-40%
				Cl_2	(of Cl_2 flow) CHF_3	(of Cl_2 flow) Ar
	More Preferred Range	560	140	40 sccm	17.5% (of Cl_2 flow) CHF_3	37.5% (of Cl_2 flow) Ar

This example reads on, an oxygen-free plasma etching gas formulation comprising: CHF_3 , argon, and chlorine, the gas formulation being free of SF_6 , and encompassing a ratio of flow rates of CHF_3 : argon: chlorine in the formulation is 5 to 80

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sccm: 5 to 80 sccm: 5 to 60 sccm, **in claim 18**. No patentable weight is given to the phrase, "for removing an organic ARC on a metallic layer." Likewise the intended use of composition is not patentably significant. *In re Albertson* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abraham (US 5,846,443).

Abraham teaches an etchant gas composition that comprises Cl_2 , HCl , and CHF_3 (Abstract, column 6, lines 54-56) and further teaches "It is contemplated that some

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additives, e.g., N_2 , may be added if desired" (column 6, lines 63-64), which reads on an oxygen-free plasma etching gas formulation comprising CHF_3 and HCl , and the gas formulation being free of SF_6 .

Abraham differs in failing to teach the etchant comprises argon.

Gases such as nitrogen and noble gases such argon are known inert gases that are used as carriers and diluents.

It would have been obvious to one to having ordinary skill in the art at the time of the claimed invention to modify Abraham by using argon for the purpose of obtaining the claimed invention.

6. Claims 14, 21, 29 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishitani et al. (US 5,498,768).

Nishitani teaches, "... plasma treatment ... using halogen-containing chemical etching gases ... such as Cl_2 , BCl_3 , CCl_4 , C_2Cl_4 , $SiCl_4$, NF_3 , CF_4 , CHF_3 , SF_6 and SiF_4 each alone or as a mixture thereof with inert gases such as Ar" (column 5, lines 24-32), which comprises an oxygen-free plasma etching gas formulation comprising: CHF_3 , Ar and BCl_3 , in claim 14, and 29; and (i) more than one fluorine containing compound, (ii) an inert carrier gas selected from the group consisting of argon, and (iii) chlorine, in claim 21 and 31.

Nishitani succeeds at disclosing plasma gas components corresponding to those claimed by applicants. It is noted that the reference is silent about a specific combination of gases corresponding to those claimed by applicants.

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It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to select any combination of disclosed etchant gases, including those defined in applicants' claims because Nishitani illustrates that such gases are known to be suitable etchant gases.

Nishitani further differs in failing to teach the gas formulation wherein the inert carrier gas is neon and helium respectively, **in claims 32 and 33**.

It is the examiner's position that inert gases such as helium and neon are known and are used as diluents and that it would have been obvious to one to having ordinary skill in the art at the time of the claimed invention to modify Nishitani by using a known inert gas for the purpose of obtaining the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ltue

March 2, 2004

NADINE G. NORTON
PRIMARY EXAMINER
